

## **REMARKS/ARGUMENTS**

Reconsideration of this application is requested. Claims 19-41 are in the case.

### **I. THE SPECIFICATION**

The specification has been amended to include a brief description of the drawings. Other customary headings have also been included. No new matter is entered.

### **II. THE 35 U.S.C. §112, SECOND PARAGRAPH, REJECTION**

Claims 19-41 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite for the reasons detailed on page 2 of the Action. In response, and without conceding to the merit of this rejection, claim 19 has been amended to specify that the separation is carried out in a single distillation means. Basis for this amendment is to be found at page 3, lines 12-15. No new matter is entered. Withdrawal of this rejection is now respectfully requested.

### **III. THE OBVIOUSNESS REJECTION**

Claims 19-41 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent 6,143,921 to Karim et al. That rejection is respectfully traversed.

The present invention relates to an integrated process for the production of an alkenyl carboxylate such as vinyl acetate. In the first step of the process, an alkane such as ethane is oxidized to produce a product stream which is separated into a gaseous stream and a liquid stream (carboxylic acid and water). The gaseous stream,

carboxylic acid and oxygen are fed to a second reactor for the production of the alkenyl carboxylate. The liquid stream is fed to a distillation unit. The product stream from the alkenyl carboxylate reactor (alkenyl carboxylate, carboxylic acid and water) is also fed to the distillation unit.

In the Karim process, the liquid stream from the liquid/gas separator is fed to a distillation unit; the product stream from the vinyl acetate reactor is separated into a gaseous fraction and a liquid fraction. The liquid fraction (vinyl acetate, acetic acid and water) is fed to a second distillation unit. Thus, in Karim, two distillation columns are employed, the acid and water stream from the oxidation reactor is fed to one distillation column and the vinyl acetate/acetic acid/water stream from the vinyl acetate reactor is fed to a second distillation column (see Fig. 1).

In the present invention as claimed, a single distillation column is used to separate the acetic acid/water stream and vinyl acetate/acetic acid/water stream with the objective of recovering vinyl acetate product. Both of these streams contain water. Thus, by carrying out the separation in a single column, the total amount of water in the column is much larger than it would be in the separation of vinyl acetate/acetic acid/water alone. Unexpectedly, it has been found that this larger amount of water enables a vinyl acetate product to be produced which contains a reduced amount of by-product, such as ethyl acetate. This can be seen from a comparison of the results given in Tables 2 and 3. Table 2 represents the distillation of a vinyl acetate/acetic acid/water stream and Table 3 represents the combined distillation of vinyl acetate/acetic acid/water and acetic acid/water streams. In Table 2 the amount of ethyl acetate by-product in the vinyl acetate product is 0.46, whereas in the combined distillation of the

invention, the amount of ethyl acetate in the vinyl acetate product is significantly lower at only 0.006.

There is no suggestion in Karim which would motivate one of ordinary skill to combine the two distillation stages of Karim. Furthermore, the skilled person would have no expectation from Karim that a single distillation stage would enable the production of an improved vinyl acetate product. In fact, Karim leads away from the present invention, in that the first distillation column of Karim is used to separate acetic acid from water, the water being recycled to the oxidation reactor, whereas it has been found according to the present invention that it is the presence of a larger quantity of water which leads to the benefits of improved product quality.

In light of the above, it is believed to be clear that one of ordinary skill in the art would not have been motivated to arrive at the presently claimed invention based on Karim. Absent any such motivation, a *prima facie* case of obviousness has not been generated in this case. Reconsideration and withdrawal of the outstanding obviousness rejection are accordingly respectfully requested.

#### **IV. DOUBLE PATENTING**

Claims 19-41 are rejected on the ground of non-statutory obviousness-type double patenting over US 6,727,380, US 6,548,697 and US 7,078,563 because although the claims of these patents do not recite a step of separating at least a portion of the carboxylic acid and water fraction produced in step (b) by azeotropic distillation into an overhead fraction comprising alkenyl carboxylate and a base fraction comprising carboxylic acid, separation of a product stream to recover carboxylic acids is allegedly

obvious. In addition, claims 19-41 are provisionally rejected over co-pending application no. 10/505,660 for the same reason.

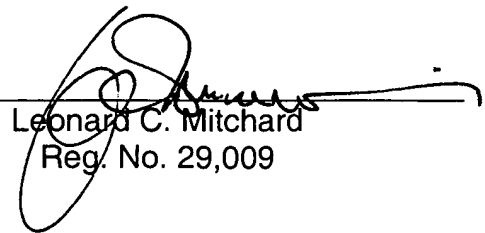
It is unclear from the wording of the double-patenting objection (and indeed the rejection in view of Karim) as to whether step (d) of claim 19 of the present application has been misunderstood. Step(d) recites separation of two different streams from two different reactions in a single distillation column to recover an alkenyl carboxylate as product. None of the claims in the afore-mentioned patents/patent application recites distillation from either the oxidation reaction or the alkenyl carboxylate reaction. Thus, it is not seen why it would be obvious to one of ordinary skill to combine the distillation of streams from both of these reactions to produce an improved alkenyl carboxylate product. Withdrawal the double-patenting and provisional double-patenting rejections is respectfully requested.

Favorable action on this application is awaited.

Respectfully submitted,

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